CLAIMS

1. A method of fabricating a three-axis accelerometer including the steps of;

providing a first wafer of insulating material having a first major surface and a second major surface,

etching at least two cavities in the first major surface of the first wafer,

patterning metal onto the first major surface of the first wafer to form electrical connections for a third accelerometer,

providing a second wafer of semiconducting material, etching a portion of a first major surface of the second wafer,

bonding the first major surface of the first wafer to the first major surface of the second wafer so that at least part of the etched portion of the second wafer is above at least part of the metal on the first wafer,

depositing and patterning metallization on the second major surface of the second wafer,

depositing and patterning a masking layer on the second major surface of the second wafer defining the shape of a first accelerometer, a second accelerometer and the third accelerometer so that the first and second accelerometers will be formed over the cavities etched in the first major surface of the first wafer,

etching the second major surface of the second wafer to form the accelerometer where the first and second accelerometers each include at least two independent sets of the beams, and

removing the masking layer from the second major surface of the second wafer.

2. A method of fabricating a three-axis accelerometer as claimed in claim 1 wherein the first wafer is an insulating material.

3. A method of fabricating a three-axis accelerometer as claimed in claim 2 wherein the first wafer is formed from glass.

4. A method of fabricating a three-axis accelerometer as claimed in claim 2 wherein the first wafer is formed from borosilicate glass.

5. A method of fabricating a three-axis accelerometer as claimed in any one of claims 1 to 4 wherein the etch step used to form cavities in the first major surface of the first wafer is an anisotropic etch.

6. A method of fabricating a three-axis accelerometer as claimed in any one of claims 1 to 5 wherein the metal deposited on the wafer is chromium/gold.

7. A method of fabricating a three-axis accelerometer as claimed in any one of claims 1 to 6 wherein the step of patterning metal on the first major surface of the first wafer forms a first electrical connection for the third accelerometer.

8. A method of fabricating a three-axis accelerometer as claimed in any one of claims 1 to 7 wherein the step of patterning metal on the first major surface of the first wafer forms at least one metal plate on either side of the first electrical connection to form a capacitor on each side of the first electrical connection of the third accelerometer.

9. A method of fabricating a three-axis accelerometer as claimed in any one of claims 1 to 8 wherein the second wafer is formed of silicon.

10. A method of fabricating a three-axis accelerometer as claimed in any one of claims 1 to 9 wherein the second major surface of the second wafer is thinned to a required thickness after the step of bonding the first wafer to the second wafer.

11. A method of fabricating a three-axis accelerometer as claimed in any one of claims 1 to 10 wherein the step of bonding the wafers is performed by an anodic bond.

12. A method of fabricating a three-axis accelerometer as claimed in any one of claims 1 to 10 wherein the step of bonding the wafers is performed by a eutectic bond

13. A method of fabricating a three-axis accelerometer as claimed in any one of claims 1 to 10 wherein the step of bonding the wafers is performed by a thermocompression bond.

14. A method of fabricating a three-axis accelerometer as claimed in any one of claims 1 to 13 wherein the metal deposited on the second major surface of the second wafer is chromium/gold.

15. A method of fabricating a three-axis accelerometer as claimed in any one of claims 1 to 14 wherein the metal deposited on the second major surface of the second wafer forms electrical connections for the first and second accelerometers.

16. A method of fabricating a three-axis accelerometer as claimed in claim 1 wherein each set of beams is anchored to the wafer.

17. A method of fabricating a three-axis accelerometer as claimed in any one of claims 1 to 16 wherein one set of beams includes means to allow the beams to move with side to side motion from one end of the beams.

18. A method of fabricating a three-axis accelerometer as claimed in claim 17 wherein the means to allow the beams to move is a spring or tether means.

19. A method of fabricating a three-axis accelerometer as claimed in any one of claims 1 to 18 further including the step of masking the wafer before the step of etching the wafer.

20. A method of fabricating a three-axis accelerometer as claimed in any one of claims 1 to 19 further including the step of patterning the mask using lithography processes.